



## SOUND NAVIGATION UNCHARTED WATERS

New Zealand Society of Actuaries Conference 2010  
21 - 24 November • Blenheim



# Sailing a Course through Risk Margins

## Will it be perilous?

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November 2010

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# Agenda

IASB Exposure Draft measurement model

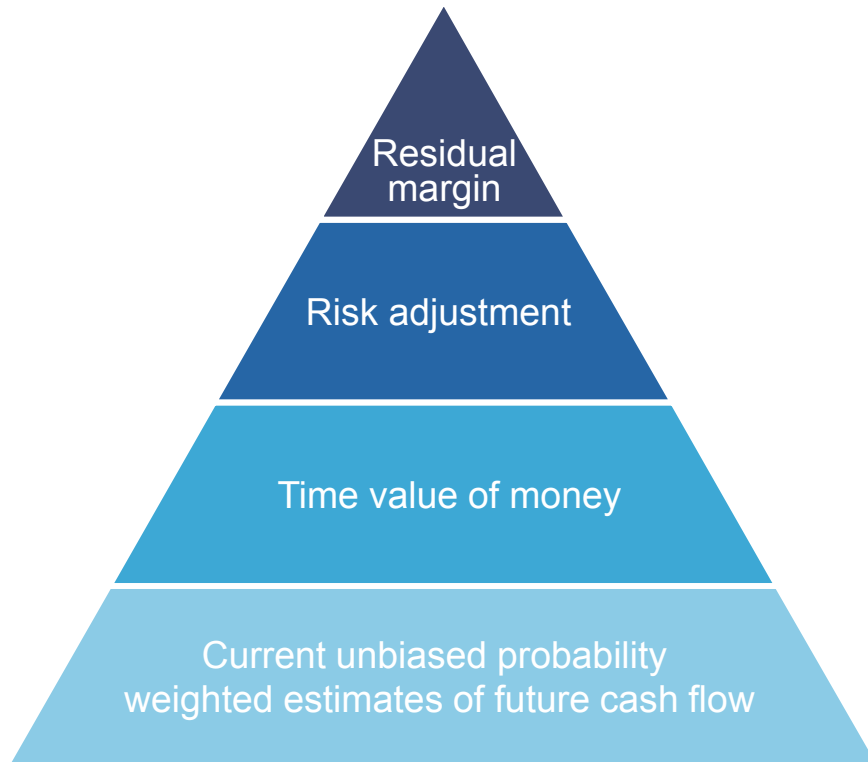
Development of Risk Adjustment

Risk Adjustment techniques

International views

The Future – will it be perilous?

# Measurement Model Overview



## Fulfilment rather than an exit objective

Margin to ensure no profit emerges at outset

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Explicit estimate of the effects of uncertainty  
about the amount and timing of cashflows

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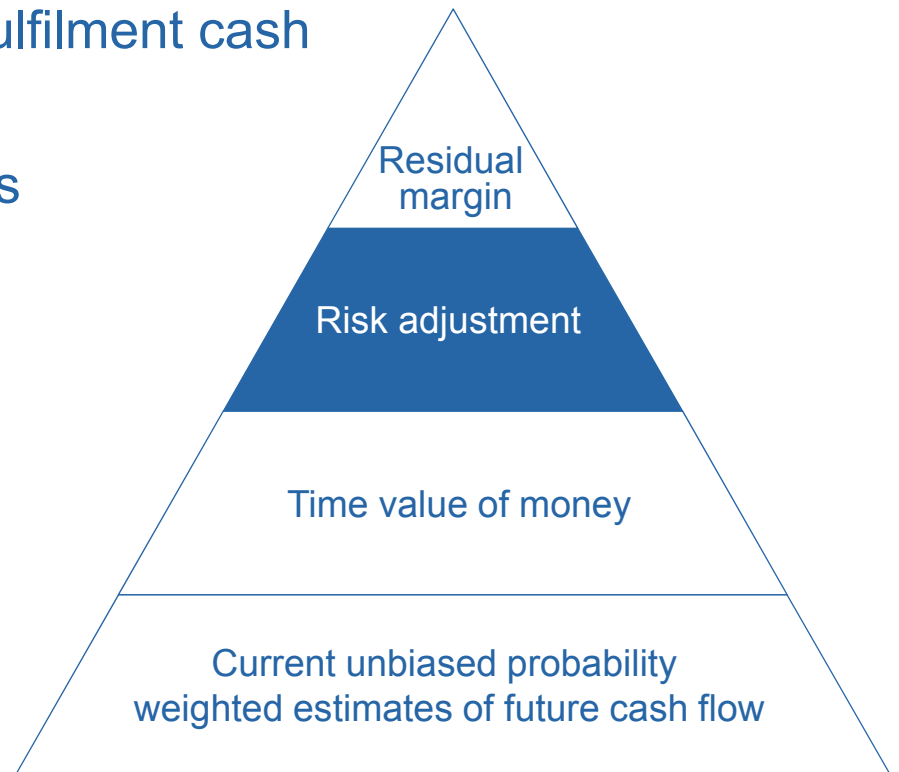
Discount rate consistent with observable  
market prices

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Explicit, unbiased, probability weighted  
estimate of future fulfilment cashflows

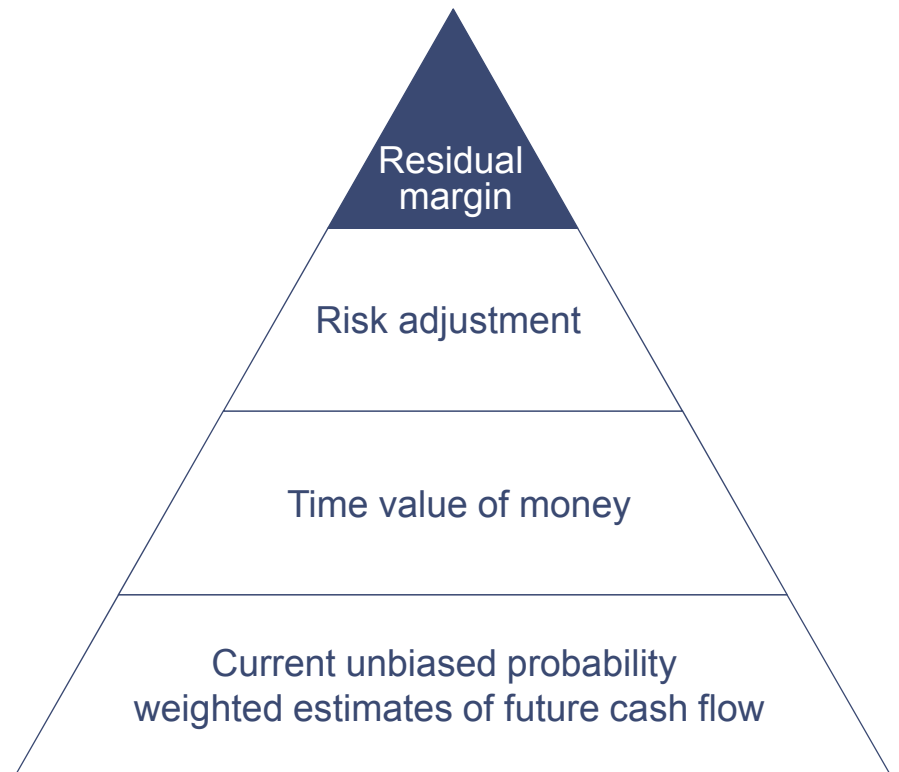
# Risk adjustment

- Objective of risk margin to reflect the maximum amount that an insurer would rationally pay to be relieved of the risk that the ultimate fulfilment cash flows exceed those expected
- Limited range of permitted techniques
- Diversification at portfolio level  
‘Subject to broadly similar risks and managed together as a single pool’

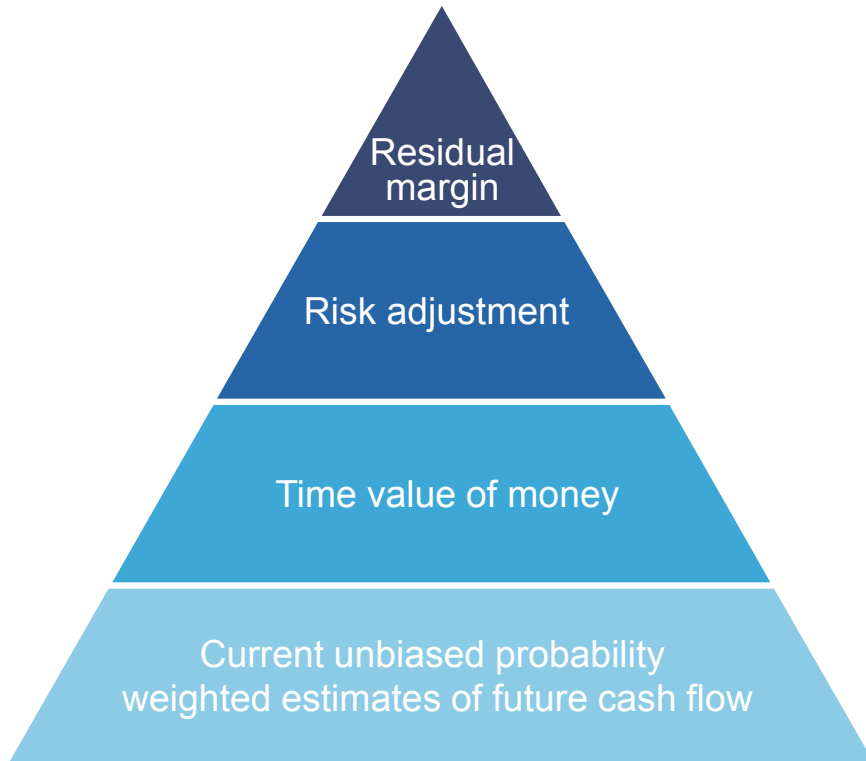


# Residual margin

- Residual margin amortised in systematic way over coverage period
  - Passage of time; or
  - Expected timing of claims and benefits if different
- Interest accreted at locked in rate
- Residual margin cannot be negative



# Subsequent measurement



## Remeasurement



Amount initially recognised is unwound but not remeasured



Updated for current estimates



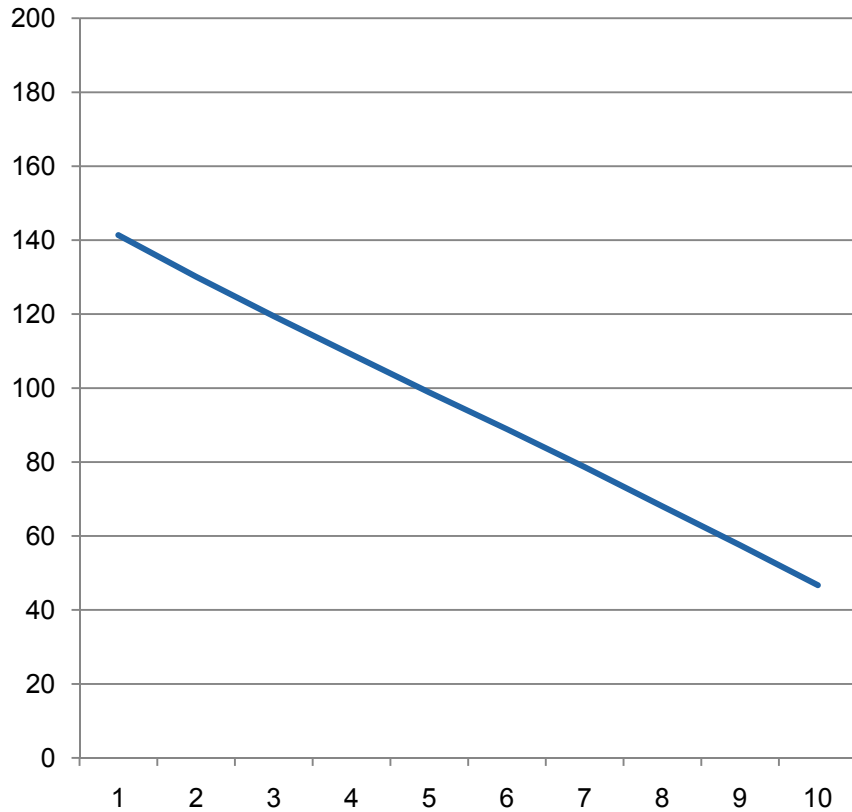
Updated for market rates



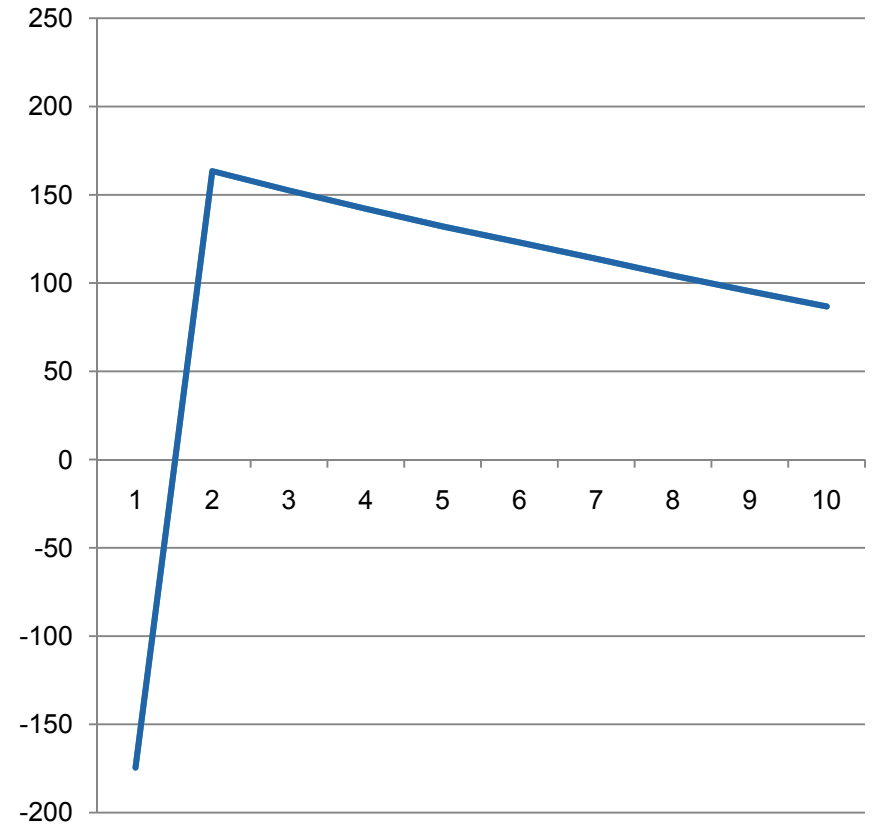
Updated for current estimates

# Profit Signature – MoS vs Exposure Draft

Base - Margin on Services

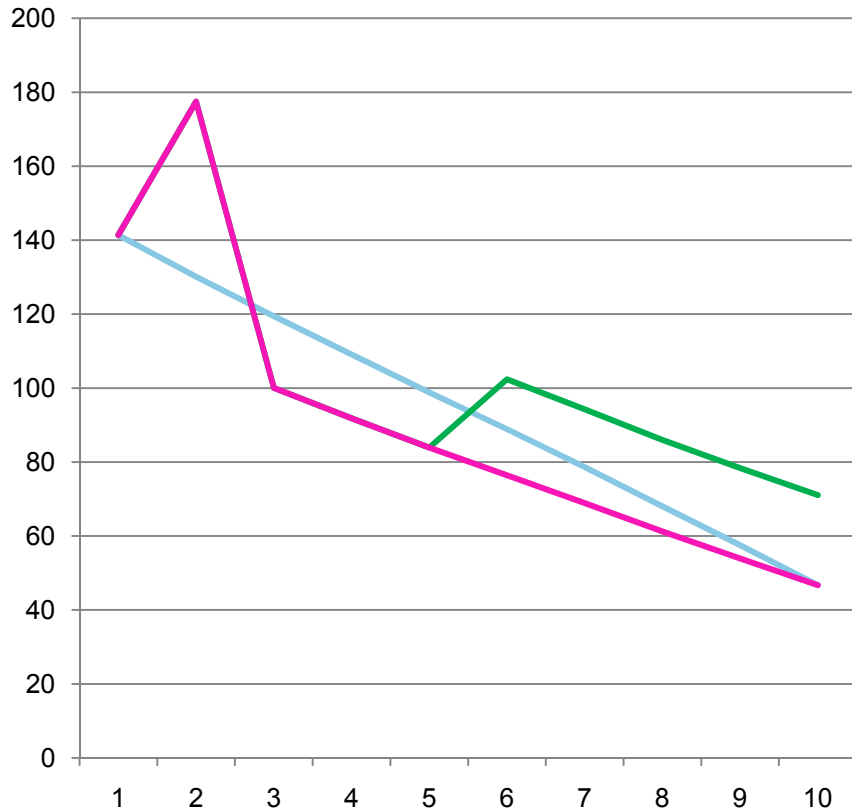


Base - Exposure Draft

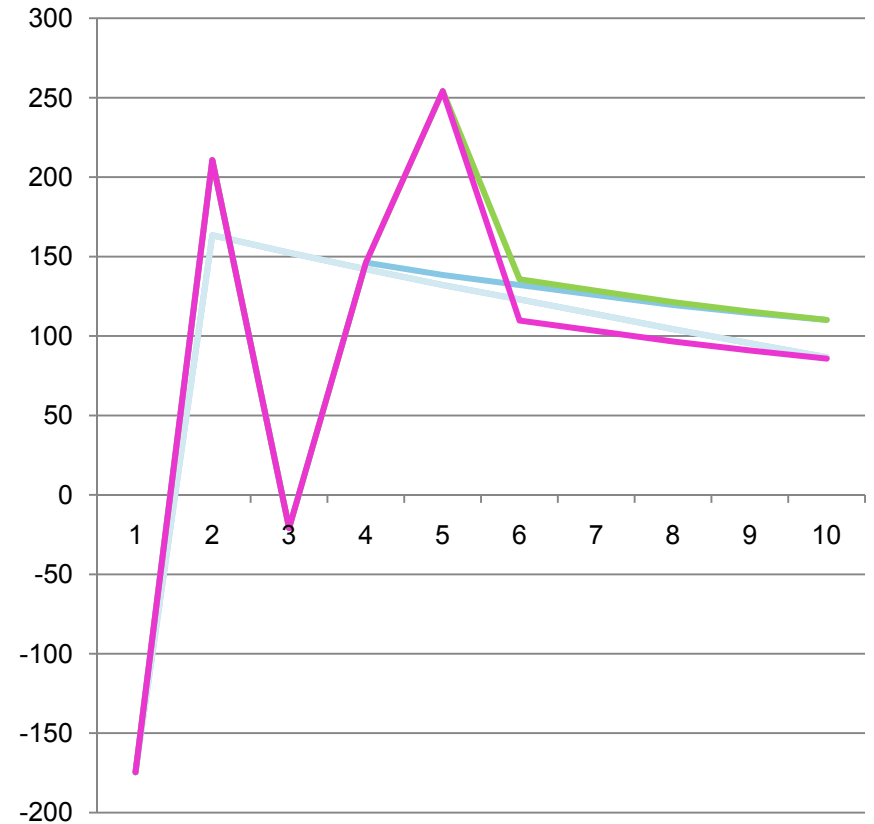


# Profit Signature – MoS vs Exposure Draft

Experience - Mos



Experience - Exposure Draft



# Impact of Risk Adjustment on Profit

- Increases potential volatility due to remeasurement
- Important part of the ED methodology
- Transition
  - No residual margin
  - Setting of initial risk adjustment important in profit emergence thereafter

# Risk Adjustment definition

“The risk adjustment shall be the maximum amount that an insurer would rationally pay to be relieved of the risk that the ultimate fulfilment cashflows exceed those expected.” (ED paragraph 17)

The aim is to make an adjustment to the discounted cashflows for the “effects of uncertainty about the amount and timing of those future cashflows”

# IASB Conclusions: Risk Adjustment should ....

- Provide useful information to users about risk inherent in insurance contracts
- Reflect the insurer's view of the economic burden of that risk
- Ensure that the measurement of a risk liability includes allowance for risk (as opposed to being risk free)
- Be conceptually consistent with the valuation of other assets and liabilities which include allowance for risk
- Reduce the amount that that would be release to profit in an arbitrary manner (eg. residual margin)

# Objections to the Risk Adjustment

- Not possible to calculate an explicit risk adjustment objectively
- Risk adjustment & residual margin likely to vary significantly by insurer for same underlying risk leading to differences in profit recognition
- No single technique for calculation is universally used and accepted
- Some techniques difficult to explain
- Difficulties in back testing whether risk adjustment was appropriate
- Cost of developing calculation systems
- Inconsistency with IASB's revenue recognition proposals
- An increase in the risk adjustment will cause an initial loss which would reverse over time – this is likely to be confusing to users

# Composite Margin

## Pros

- Not possible to calculate an explicit risk adjustment objectively
- Risk adjustment & residual margin likely to vary significantly by insurer for same underlying risk leading to differences in profit recognition

## Cons

- Provides no information on risk
- Implications for separation of embedded options & guarantees
- Inconsistent with pricing of financial instruments & written options
- Inconsistent with IAS 37 proposals
- Lack of principle in run-off pattern

# Risk Adjustment Calculation

- Needs to cover all risks associated with insurance contract – mortality, morbidity, lapse, expense
- Remeasured at end of each reporting period
- Calculated at portfolio level – group of contracts that are subject to similar risks and managed together as a pool
- Can allow for diversification within, but not between, portfolios
- Calculate gross and reinsurance separately

# Risk Adjustment Characteristics

The stated characteristics for the risk adjustment are:

- a) Risks with low frequency and high severity will result in higher risk adjustments than risks with high frequency and low severity
- b) For similar risks, contracts with a longer duration will result in higher risk adjustments than those of a shorter duration
- c) Risks with a wide probability distribution will result in higher risk adjustments than those risks with a narrower distribution
- d) The less that is known about the current estimate and its trend, the higher the risk adjustment shall be
- e) To the extent that emerging experience reduces uncertainty, risk adjustments will decrease and vice versa.

# Allowable techniques

- Confidence interval
- Conditional tail expectation
- Cost of capital

# Other techniques considered

- Explicit assumption methods
  - factor based methods
  - judgement based on experience studies
- Multiple of second and higher moments of risk distribution
- Discount rates
  - Risk adjusted returns
  - Deflators
- Stress/sensitivity testing
- Stochastic modelling
- Calibration to capital markets or insurance pricing
- Implicit (but unspecified) confidence interval

# Confidence Interval - methodology

Extra amount to be added to expected value so probability of outcome less than expected plus risk margin equals target confidence interval.

- Familiar from general insurance context
  - Relatively complex and tends to be ad-hoc
- To cover all risks related to insurance contracts – mortality, morbidity, lapse and expense
  - Can a probability distribution be determined for best estimate liability?
  - Or will a distribution be required for each risk?
- What allowance to make for diversification?

# Confidence Interval – Setting confidence level

Very little guidance on how this should be determined.

In general:

- The greater the uncertainty in the best estimate assumptions, the larger should be the risk adjustment. Consideration should be given to the degree to which experience data is relevant, reliable and/or credible.
- Margins should reflect fluctuation in historical experience
- Changes in environment that might limit the applicability of past experience to future obligations would be another area of uncertainty
- The methodology to determine the margin level should be applied consistently.

# Confidence Interval – pros and cons

## Pros

- Easy to communicate
- Best suited to distributions which are not highly skewed and do not vary significantly over time

## Cons

- Hard to apply when probability distribution not statistically normal
- Difficult to apply to some risks/assumptions eg. expenses
- Requires judgment in setting the confidence level
- Difficulty in determining allowance that should be made for management actions that might mitigate risk
- Difficulty in determining allowance for diversification

# Confidence Interval - Conclusion

Seems simple but definite complexities involved in practice

# Conditional Tail Expectation

Risk margin is calculated as the expected value of the outcomes in the extreme of the distribution less the mean.

Thus a 75% confidence level is the expected value of all outcomes that are in the highest 25% of the distribution.

It is most useful when more extreme events need to be considered.

# CTE – pros and cons

## Pros

- Provides a better reflection of the potential extremes than the confidence interval approach and is more appropriate to use when the underlying distribution is heavily skewed
- Particularly useful for insurance contracts with skewed payments – eg those with embedded options, interest guarantees, or covering low-frequency, high-severity risks, or where signification concentration of risk

## Cons

- However one of the practical issues is whether enough is actually known of the extremes of the underlying distribution of outcomes.

# Cost of Capital

The rationale behind the cost of capital approach is that the insurer will need to hold a sufficient amount of capital (regardless of any regulatory requirement) to ensure that it can fulfil its obligation to policyholders.

The risk adjustment then reflects the compensation the insurer will require for holding that capital.

# Cost of Capital

1. Calculate the amount that the entity would need to hold with a high degree of certainty (say 99.5%) that the amount would be sufficient to cover its obligations to policyholders. Effectively this should capture nearly the entire tail of the distribution as per confidence interval approach.
2. The difference between the amount calculated and the expected value represents the capital required.
3. The risk adjustment is then calculated as the cost of holding the capital amount required in all future periods, and then discounted to the current period using the risk free rate of return.

# Capital Amount

- Regulatory – eg Solvency II
- Economic Capital
- New Zealand – could we use part of the new regulatory capital calculation – eg. Insurance Risk Capital Charge

# Cost of Capital Charge

- Should only reflect the return demanded above the risk free rate and only uncertainty relating to the insurance contract
- Risks unrelated to the insurance contract liability such as asset risks, mismatch risks and operational risks should not be allowed
- Solvency II and the Swiss Solvency Test – set by the regulator
- IASB – will need to be determined by the insurer.
- Recognised for further research

# Cost of Capital – pros and cons

## Pros

- Implicitly takes into account diversification
- Relatively easy to implement if economic capital models already exist
- Stability of calculation across reporting periods
- Consistent with how investors view the business

## Cons

- Difficulties in determining an appropriate cost of capital to use
- Potential to be influenced by regulatory solvency capital requirements
- Need to calculate the capital amount at each future reporting date
- No clear and transparent feedback on appropriateness of resulting margin
- Need to calibrate for disclosure to confidence interval probability of sufficiency

# International use and view

## Europe

- Cost of capital used for Solvency II
- European CRO Forum – favour cost of capital approach

## Australia

- Concern re risk adjustment and residual margin
- Advocate residual margin as shock absorber

## FASB

- Composite margin

## International Actuarial Association

- Risk Margin Working Group paper

# The Future?

- Submissions on ED due 30 November
- IASB likely to move quickly due to members leaving
- Unless clear steer away from explicit risk adjustment in submissions, highly likely to remain
- More research and guidance required
- Europe – Solvency II

# Implications for New Zealand

- Definite complexity involved
- Clear computational advantages if could use cost of capital leveraging off regulatory capital calculations
- Possible implications for company structures

# Will it be perilous?

## Thoughts/comments/questions???